Claims:

Amend the claims 1, 4-9, 11 and 16 as follows:

Claim 1 (currently amended): A multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication comprising:

~~a MIMO-based multimode and multiband RF unit of W-CDMA, WLAN and UWB;~~

~~a W-CDMA rake and baseband processor;~~

~~a dual-mode WLAN and UWB OFDM processor;~~

~~a tri-mode interleaver;~~

~~a tri-mode coding processor;~~

~~a sharing memory bank;~~

~~a tri-mode control processor of W-CDMA, WLAN and UWB;~~

~~a multiple antenna unit including four identical antennas.~~

a MIMO-based multimode and multiband RF unit including W-CDMA, WLAN and UWB connected to a multiple antenna unit in which includes N antennas, where N is an integer and greater than 1;

said MIMO-based multimode and multiband RF unit connected to a WLAN and UWB OFDM processor in which coupled to a sharing memory bank, an interleaver, and a W-CDMA, WLAN, and UWB control processor coupled to a coding processor;

said MIMO-based multimode and multiband RF unit connected to a W-CDMA Rake and baseband processor in which coupled to the sharing memory bank, the interleaver, and the W-CDMA, WLAN, and UWB control processor;

said MIMO-based multimode and multiband RF unit connected to the sharing memory bank in which coupled to the WLAN and UWB OFDM processor, the W-CDMA Rake and baseband processor, and the W-CDMA, WLAN, and UWB control processor;

said MIMO-based multimode and multiband RF unit connected to the W-CDMA, WLAN, and UWB control processor in which coupled to the sharing memory bank, the W-CDMA Rake and baseband processor, the WLAN and UWB OFDM processor, the interleaver, and the coding processor;

the interleaver coupled to the W-CDMA, WLAN, and UWB control processor, the W-CDMA Rake and baseband processor, the WLAN and UWB OFDM processor, and the coding processor; and

the coding processor coupled to the interleaver and the W-CDMA, WLAN, and UWB control processor.

Claim 2 (original): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 1, wherein the W-CDMA rake and baseband processor further comprises two digital receiver filters coupled to two down samplings, a MUX, two spreaders, a despreader sequence generator, a rake receiver unit, and a descrambler coder generator.

Claim 3 (original): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 2, wherein said two digital receiver filters coupled to two down samplings are equivalent to two decimation filters in which have linear phases and symmetric filter coefficients in programmable.

Claim 4 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 1, wherein the MIMO-based multimode and multiband RF unit ~~of W-CDMA, WLAN and UWB~~ further comprises ~~four~~ N analog bandpass filters, ~~four~~ N LNA, ~~four~~ N AGC, a sum over block, a selection switch, a W-CDMA down converter and demodulation, a WLAN down converter and demodulation, a multiband UWB down converter and demodulation, and a tri-mode A/D converter unit, where N is an integer and greater than 1.

Claim 5 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 4, wherein the tri-mode A/D converter unit further comprises:

two selection switches with three inputs and one output;

each of said two selection switches connects one input of W-CDMA, WLAN or UWB signals;

~~eight~~ M A/D converters with uniform ~~frequency~~ sampling rate and resolution, where M is a integer and greater than 1;

two of said ~~eight~~ M A/D converters for W-CDMA mode or WLAN mode; and

~~Said~~ said ~~eight~~ M A/D converters for UWB mode.

Claim 6 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 1, wherein the ~~dual-mode~~ WLAN and UWB OFDM processor further comprises:

a WLAN digital decimation channel select filter unit;

a controllable selection switch with connecting either a WLAN input or an UWB input and producing a serial output;

a dual-mode WLAN and UWB serial-to-parallel (S/P) and ~~Guard~~ guard removing;

a dual-mode WLAN and UWB FFT and frequency-domain equalizer (FEQ);

a dual-mode parallel-to-serial (P/S) with either [[64]] M inputs or [[512]] N inputs in parallel and one serial output, where M and N are an integer and greater than 1;

a multiband UWB digital receiver filter, despreading and time-domain equalizer (TEQ) unit;

~~three~~ Q S/P and guard removing, where Q is an integer and greater than 1;

~~three~~ Q FFT and FEQ;

~~three~~ Q P/S with ~~512~~ N inputs in parallel and one serial output, where N is an integer and greater than 1;

a P/S with ~~four~~ P inputs in parallel and one serial output, where O is an integer and greater than 1;

a spreader; and

a user key sequence generator.

Claim 7 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 6, wherein the dual-mode WLAN and UWB FFT and FEQ further comprises a dual-mode FFT, ~~500~~ N equalizers, ~~500~~ N decision detectors, ~~500~~ N subtracts, an

adaptive algorithm, and a WLAN/UWB mode generator, where N is an integer and greater than 1.

Claim 8 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 7, wherein said dual-mode FFT has either [[1024]] 2N inputs and [[500]] N outputs in parallel for UWB operation or [[64]] M inputs and [[64]] M outputs in parallel for WLAN operation, where N and M are integers and greater than 1.

Claim 9 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 7, wherein said dual-mode WLAN and UWB FFT and FEQ uses the dual-mode FFT with [[64]] M inputs and [[64]] M outputs in parallel, [[64]] M equalizers, [[64]] M decision detectors, [[64]] M subtracts, and the adaptive algorithm during WLAN operation, where M is an integer and greater than 1.

Claim 10 (original): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 7, wherein said adaptive algorithm is a least mean square (LMS), a recursive least squares (RLS) or a constant modulus algorithm (CMA).

Claim 11 (currently amended): The multimode and multiband MIMO transceiver of W-CDMA, WLAN, and UWB communication of claim 6, wherein the multiband UWB digital receiver filter, despreading and TEQ unit further comprises [[four]] N signal processing branches in parallel, each of

said signal processing braches including two digital receiver filters coupled to two spreaders, which are used to despread input signals with two sequences from a multiband despreading generator, and the outputs of said two spreaders are multiplied by a MUX followed by a TEQ, where N is an integer and greater than 1.

Claim 12 (original): A multimode and multiband MIMO-based W-CDMA, WLAN, and UWB communication receiver comprising:

four antennas coupled to a multimode and multiband W-CDMA, WLAN and UWB RF unit;

the multimode and multiband W-CDMA, WLAN and UWB RF unit coupled to a W-CDMA rake and baseband processor, a dual-mode WLAN and UWB OFDM processor, a sharing memory bank, and a tri-mode control processor of W-CDMA, WLAN and UWB;

said W-CDMA rake and baseband processor, said dual-mode WLAN and UWB OFDM processor, said sharing memory bank, and said tri-mode control processor of W-CDMA, WLAN and UWB coupled to a tri-mode interleaver; and

the tri-mode interleaver coupled to a coding processor in which is controlled by said tri-mode control processor of W-CDMA, WLAN and UWB.

Claim 13 (original): The multimode and multiband MIMO-based W-CDMA, WLAN, and UWB communication receiver of claim 12, wherein the multimode and multiband W-CDMA, WLAN and UWB RF unit further comprises:

four analog signal processing branches, each of said analog signal processing branches including an analog

bandpass filter coupled to a LNA followed by a AGC, which are summed by a sum over a block followed by a selection switch;

said selection switch connects to a W-CDMA down converter and demodulation during a W-CDMA mode or to a WLAN down converter and demodulation during a WLAN mode or to an UWB down converter and demodulation during UWB mode; and

said W-CDMA down converter and demodulation, said WLAN down converter and demodulation, and said UWB down converter and demodulation in parallel coupled to a tri-mode A/D converter unit.

Claim 14 (original): The multimode and multiband MIMO-based W-CDMA, WLAN, and UWB communication receiver of claim 13, wherein said each of said analog signal processing branches, including analog bandpass filter coupled to a LNA followed by a AGC is programmable in parameters and has scalability functions.

Claim 15 (original): The multimode and multiband MIMO-based W-CDMA, WLAN, and UWB communication receiver of claim 12, wherein the dual-mode WLAN and UWB OFDM processor further comprises:

a WLAN digital decimation channel select filter unit coupled to a selection switch followed by a WLAN signal processing branch including a dual-mode WLAN and UWB S/P and guard removing, a dual-mode WLAN and UWB FFT and FEQ, and a dual-mode P/S;

said dual-mode P/S having either 64 inputs and an output or 512 inputs and an output;

a multiband UWB digital receiver filter, despreading and TEQ unit coupled to said WLAN signal processing branch and three UWB signal processing branches that are combined by a P/S followed by a spreader supported by an user-p key generator; and

each of the said UWB signal processing branches including a S/P and guard removing coupled to a FFT and FEQ followed by a P/S.

Claim 16 (currently amended): An article comprising a medium storing instructions adapted to be executed to perform a method that causes a processor-based system to:

set the processor-based system in a receiver mode depending on whether received signals belong to W-CDMA, WLAN or UWB; and

set the processor-based system to perform a W-CDMA function and to turn off WLAN and UWB functions during W-CDMA mode;

set the processor-based system to perform the WLAN function and to turn off the W-CDMA and the UWB functions during WLAN mode; or

set the processor-based system to perform the UWB function and to turn off the W-CDMA and the WLAN functions during UWB mode[[;]].

Claim 17 (original): The article of claim 16 further storing instructions that cause a processor-based system during a W-CDMA mode to:

set W-CDMA parameters for bandpass filters, LNA and AGC;

control a switch to connect with a W-CDMA down converter and demodulation;

select two A/D converters out of eight A/D converters for W-CDMA signals; and

set W-CDMA parameters for a tri-mode interleaver and a tri-mode decoding.

Claim 18 (original): The article of claim 16 further storing instructions that cause a processor-based system during a WLAN mode to:

set WLAN parameters for bandpass filters, LNA and AGC;

control a switch to connect with a WLAN down converter and demodulation;

select two A/D converters for WLAN signals; and

set WLAN parameters for a FFT and FEQ, the tri-mode interleaver and the tri-mode decoding.

Claim 19 (original): The article of claim 16 further storing instructions that cause a processor-based system during an UWB mode to:

set UWB parameters for bandpass filters, LNA and AGC;

control a switch to connect with a UWB down converter and demodulation;

select eight A/D converters for UWB signals; and

set UWB parameters for a FFT and FEQ, an tri-mode interleaver and a tri-mode decoding.